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L1	1	("6064393").PN.	USPAT; USOCR	OR	OFF	2004/11/10 13:54
L3	12	hair same model\$3 same real-time	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/11/10 13:55
L5	1	hair same model\$3 and grid same element and real-time	US-PGPUB; USPAT	OR	ON	2004/11/10 14:40
L6	55	hair and model\$3 and grid same element and real-time	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT	OR	ON	2004/11/10 14:51
L7	1	6 and hair same extend\$	USPAT	OR	OFF	2004/11/10 14:42
L8	30	(345/583).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:52
L9	926	(345/589).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:52
L10	627	(345/582).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:52
L11	471	(345/581).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:52
L12	702	(345/420).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:53
L13	627	(345/427).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:53
L14	442	(345/428).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:53
L15	752	(345/441).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:53
L16	322	(345/442).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/11/10 14:53
L18	0	8 and hair same model same real-time	USPAT	OR	OFF	2004/11/10 14:56
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1 [Algorithms: Significant facet retrieval for real-time 3D sound rendering in complex virtual environments](#)

Chris Joslin, Nadia Magnenat-Thalmann

 October 2003 **Proceedings of the ACM symposium on Virtual reality software and technology**

 Full text available: pdf(367.63 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Sound rendering requires that many different aspects are considered simultaneously, especially when rendering a real-time virtual environment. In 3D sound rendering, much the same as for graphics, one of the major influencing factors is the number of reflective polygons in a scene and due to the increase in the ability of most common graphics cards this number can now be very high, especially when scene designers produce an optimum scene using other optimizing tools such as Polygon Cruncher or R ...

Keywords: bounding-box, scene segmentation, sound rendering, virtual environments

2 [Interactive modeling: Interactive modeling of topologically complex geometric detail](#)

Jianbo Peng, Daniel Kristjansson, Denis Zorin

 August 2004 **ACM Transactions on Graphics (TOG)**, Volume 23 Issue 3

 Full text available: pdf(1.73 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Volume textures aligned with a surface can be used to add topologically complex geometric detail to objects in an efficient way, while retaining an underlying simple surface structure. Adding a volume texture to a surface requires more than a conventional two-dimensional parameterization: a part of the space surrounding the surface has to be parameterized. Another problem with using volume textures for adding geometric detail is the difficulty in rendering implicitly represented surfaces, especia ...

Keywords: modeling, volumetric rendering, volumetric texture

3 [Surfels: surface elements as rendering primitives](#)

Hanspeter Pfister, Matthias Zwicker, Jeroen van Baar, Markus Gross

 July 2000 **Proceedings of the 27th annual conference on Computer graphics and interactive techniques**

 Full text available: pdf(500.97 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Surface elements (surfels) are a powerful paradigm to efficiently render complex geometric objects at interactive frame rates. Unlike classical surface discretizations, i.e., triangles or quadrilateral meshes, surfels are point primitives without explicit connectivity. Surfel attributes comprise depth, texture color, normal, and others. As a pre-process, an octree-based surfel representation of a geometric object is computed. During sampling, surfel positions and normals are optionally pert ...

Keywords: rendering systems, texture mapping

4 Three-dimensional object recognition

Paul J. Besl, Ramesh C. Jain

March 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 1

Full text available:  pdf(7.76 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

A general-purpose computer vision system must be capable of recognizing three-dimensional (3-D) objects. This paper proposes a precise definition of the 3-D object recognition problem, discusses basic concepts associated with this problem, and reviews the relevant literature. Because range images (or depth maps) are often used as sensor input, instead of intensity images, techniques for obtaining, processing, and characterizing range data are also surveyed.

5 Simulating facial surgery using finite element models

Rolf M. Koch, Markus H. Gross, Friedrich R. Carls, Daniel F. von Büren, George Fankhauser, Yoav I. H. Parish

August 1996 **Proceedings of the 23rd annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(549.30 KB)


Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: data reconstruction, facial modeling, facial surgery simulation, finite element method

6 Facial animation & hair: Adaptive Wisp Tree: a multiresolution control structure for simulating dynamic clustering in hair motion

F. Bertails, T-Y. Kim, M-P. Cani, U. Neumann

July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available:  pdf(1.88 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Realistic animation of long human hair is difficult due to the number of hair strands and to the complexity of their interactions. Existing methods remain limited to smooth, uniform, and relatively simple hair motion. We present a powerful adaptive approach to modeling dynamic clustering behavior that characterizes complex long-hair motion. The Adaptive Wisp Tree (AWT) is a novel control structure that approximates the large-scale coherent motion of hair clusters as well as small-scaled variatio ...

7 Session P3: volume visualization I: Interactive translucent volume rendering and procedural modeling

Joe Kniss, Simon Premoze, Charles Hansen, David Ebert

October 2002 **Proceedings of the conference on Visualization '02**

Full text available:  pdf(37.78 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Direct volume rendering is a commonly used technique in visualization applications. Many of these applications require sophisticated shading models to capture subtle lighting effects and characteristics of volumetric data and materials. Many common objects and natural phenomena exhibit visual quality that cannot be captured using simple lighting models or cannot be solved at interactive rates using more sophisticated methods. We present a simple yet effective interactive shading model which capt ...

Keywords: procedural modeling, shading model, volume modeling, volume rendering

8 Cloth & deformable bodies: Simulation of clothing with folds and wrinkles

R. Bridson, S. Marino, R. Fedkiw

July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available:  pdf(251.40 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Clothing is a fundamental part of a character's persona, a key storytelling tool used to convey an intended impression to the audience. Draping, folding, wrinkling, stretching, etc. all convey meaning, and thus each is carefully controlled when filming live actors. When making films with computer simulated cloth, these subtle but important elements must be captured. In this paper we present several methods essential to matching the behavior and look of clothing worn by digital stand-ins to their ...

9 Face recognition: A literature survey

W. Zhao, R. Chellappa, P. J. Phillips, A. Rosenfeld

December 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 4

Full text available:  pdf(4.28 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

As one of the most successful applications of image analysis and understanding, face recognition has recently received significant attention, especially during the past several years. At least two reasons account for this trend: the first is the wide range of commercial and law enforcement applications, and the second is the availability of feasible technologies after 30 years of research. Even though current machine recognition systems have reached a certain level of maturity, their success is ...

Keywords: Face recognition, person identification

10 Billboard clouds for extreme model simplification

Xavier Décoret, Frédo Durand, François X. Sillion, Julie Dorsey

July 2003 **ACM Transactions on Graphics (TOG)**, Volume 22 Issue 3

Full text available:  pdf(2.52 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We introduce *billboard clouds* -- a new approach for extreme simplification in the context of real-time rendering. 3D models are simplified onto a set of planes with texture and transparency maps. We present an optimization approach to build a billboard cloud given a geometric error threshold. After computing an appropriate density function in plane space, a greedy approach is used to select suitable representative planes. A good surface approximation is ensured by favoring planes that are ...


Keywords: LOD, billboard, error-driven simplification, image-based rendering, model simplification, real-time rendering

11

Geographic Data Processing

George Nagy, Sharad Wagle

June 1979 **ACM Computing Surveys (CSUR)**, Volume 11 Issue 2

Full text available:  pdf(4.20 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

12 Painterly rendering with curved brush strokes of multiple sizes

Aaron Hertzmann

July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(435.89 KB)


Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: non-photorealistic rendering

13 Synthesizing realistic facial expressions from photographs

Frédéric Pighin, Jamie Hecker, Dani Lischinski, Richard Szeliski, David H. Salesin

July 1998 **Proceedings of the 25th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(276.04 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: facial animation, facial expression generation, facial modeling, morphing, photogrammetry, view-dependent texture-mapping

14 A lighting reproduction approach to live-action compositing

Paul Debevec, Andreas Wenger, Chris Tchou, Andrew Gardner, Jamie Waese, Tim Hawkins

July 2002 **ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 3

Full text available:  pdf(25.36 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


We describe a process for compositing a live performance of an actor into a virtual set wherein the actor is consistently illuminated by the virtual environment. The Light Stage used in this work is a two-meter sphere of inward-pointing RGB light emitting diodes focused on the actor, where each light can be set to an arbitrary color and intensity to replicate a real-world or virtual lighting environment. We implement a digital two-camera infrared matting system to composite the actor into the ba ...

Keywords: global illumination, image-based lighting, matting and compositing, radiosity, reflectance and shading

15 Natural phenomena: Blowing in the wind

Xiaoming Wei, Ye Zhao, Zhe Fan, Wei Li, Suzanne Yoakum-Stover, Arie Kaufman

July 2003 **Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer animation**

Full text available:  pdf(11.53 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present an approach for simulating the natural dynamics that emerge from the coupling of a flow field to lightweight, mildly deformable objects immersed within it. We model the flow field using a Lattice Boltzmann Model (LBM) extended with a subgrid model and accelerate the computation on commodity graphics hardware to achieve real-time

simulations. We demonstrate our approach using soap bubbles and a feather blown by wind fields, yet our approach is general enough to apply to other light-wei ...

16 4-D display of meteorological data

William L. Hibbard

January 1987 **Proceedings of the 1986 workshop on Interactive 3D graphics**

Full text available:  pdf(5.40 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The Man-computer Interactive Data Access System (McIDAS) developed at the University of Wisconsin-Madison Space Science and Engineering Center (UW-SSEC) collects large quantities of meteorological data in real time for storage, analysis and display on multi-frame video terminals. Software is being developed on the McIDAS system which produces 3-D images from a variety of meteorological data for stereo display in short animation sequences. These animation sequences are produced in a few minu ...

17 HoloSketch: a virtual reality sketching/animation tool

Michael F. Deering

September 1995 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 2 Issue 3

Full text available:  pdf(2.83 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This article describes HoloSketch, a virtual reality-based 3D geometry creation and manipulation tool. HoloSketch is aimed at providing nonprogrammers with an easy-to-use 3D "What-You-See-Is-What-You-Get" environment. Using head-tracked stereo shutter glasses and a desktop CRT display configuration, virtual objects can be created with a 3D wand manipulator directly in front of the user, at very high accuracy and much more rapidly than with traditional 3D drawing systems. HoloSke ...

Keywords: 3D animation, 3D graphics, CAD, graphics drawing systems, graphics painting systems, man-machine interface, virtual reality

18 View-dependent geometry

Paul Rademacher

July 1999 **Proceedings of the 26th annual conference on Computer graphics and interactive techniques**

Full text available:  pdf(979.62 KB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: 3D animation, 3D blending, animation systems, cartoon animation, non-photorealistic rendering, rendering

19 View planning for automated three-dimensional object reconstruction and inspection

William R. Scott, Gerhard Roth, Jean-François Rivest

March 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 1

Full text available:  pdf(517.25 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Laser scanning range sensors are widely used for high-precision, high-density three-dimensional (3D) reconstruction and inspection of the surface of physical objects. The process typically involves planning a set of views, physically altering the relative object-sensor pose, taking scans, registering the acquired geometric data in a common coordinate frame of reference, and finally integrating range images into a nonredundant model. Efficiencies could be achieved by automating or semiautomating ...

Keywords: View planning, object inspection, object reconstruction, range images

20 Texture synthesis on surfaces

Greg Turk

August 2001

Proceedings of the 28th annual conference on Computer graphics and interactive techniques

Full text available:  pdf(3.35 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Many natural and man-made surface patterns are created by interactions between texture elements and surface geometry. We believe that the best way to create such patterns is to synthesize a texture directly on the surface of the model. Given a texture sample in the form of an image, we create a similar texture over an irregular mesh hierarchy that has been placed on a given surface.

Our method draws upon texture synthesis methods that use image pyramids, and we use a mesh hierarchy to ...

Keywords: texture mapping, texture synthesis

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Computer Graphics and Applications, 2002. Proceedings. 10th Pacific Conference on , 9-11 Oct. 2002

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[\[Abstract\]](#) [\[PDF Full-Text \(366 KB\)\]](#) **IEEE CNF**
2 Visible volume buffer for efficient hair expression and shadow generation*Waiming Kong; Nakajima, M.;*

Computer Animation, 1999. Proceedings , 26-29 May 1999

Pages:58 - 65

[\[Abstract\]](#) [\[PDF Full-Text \(756 KB\)\]](#) **IEEE CNF**
3 A design tool for the hierarchical hair model*Wang, T.; Yang, X.D.;*

Information Visualisation, 2001. Proceedings. Fifth International Conference on , 25-27 July 2001

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4 V-HairStudio: an interactive tool for hair design*Zhan Xu; Xue Dong Yang;*

Computer Graphics and Applications, IEEE , Volume: 21 , Issue: 3 , May/Jun : Pages:36 - 43

[\[Abstract\]](#) [\[PDF Full-Text \(924 KB\)\]](#) **IEEE JNL**

5 Hair rendering by jittering and pseudo shadow*Kong, W.; Nakajima, M.;*

Computer Graphics International, 2000. Proceedings , 19-24 June 2000

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6 An automatic construction of a person's face model from the person two orthogonal views*Ming-Shing Su; Chun-Yen Chen; Kuo-Young Cheng;*

Geometric Modeling and Processing, 2002. Proceedings , 10-12 July 2002

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[\[Abstract\]](#) [\[PDF Full-Text \(653 KB\)\]](#) [IEEE CNF](#)

7 An improved algorithm for hairstyle dynamics*Wenjun Lao; Dehui Kong; Baocai Yin;*

Multimodal Interfaces, 2002. Proceedings. Fourth IEEE International Conference on , 14-16 Oct. 2002

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[\[Abstract\]](#) [\[PDF Full-Text \(353 KB\)\]](#) [IEEE CNF](#)

8 A thin shell volume for modeling human hair*Tae-Yong Kim; Neumann, U.;*

Computer Animation 2000. Proceedings , 3-5 May 2000

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9 Modeling realistic virtual hairstyles*Yizhou Yu;*

Computer Graphics and Applications, 2001. Proceedings. Ninth Pacific Conference on , 16-18 Oct. 2001

Pages:295 - 304

[\[Abstract\]](#) [\[PDF Full-Text \(1002 KB\)\]](#) [IEEE CNF](#)

10 Modeling hair using level-of-detail representations*Ward, K.; Lin, M.C.; Joohi, L.; Fisher, S.; Macri, D.;*

Computer Animation and Social Agents, 2003. 16th International Conference on , 8-9 May 2003

Pages:41 - 47

[\[Abstract\]](#) [\[PDF Full-Text \(407 KB\)\]](#) [IEEE CNF](#)